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The Noninvasive Invasion*

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The first use of noninvasive ventilation (NIV) to sustain patient unable to breath is reported around the end of 1920s by means of "iron lung" (negative pressure ventilation) (1). The use of intermittent positive pressure ventilation via NIV for the treatment of acute respiratory illness was first described at the mid of 1940s (2). During the following decades, NIV showed changing fortunes, and its application was limited to few centers with high expertise. As well pointed out by Pierson (3), NIV requires a clinical learning curve adding to some environmental conditions, with the result that "NIV is as much an art as a science" (3). Nevertheless, the use of NIV increased continuously in the last 20 years (3), supported by robust evidence-based findings (4, 5). This result is strongly influenced, as often occurs in clinical practice, by technological progress (6). In this issue of *Critical Care Medicine*, Stefan et al (7) demonstrate that NIV not only invaded the intensivists' daily practice but its invasion challenges the reassuring, although potentially harmful, use of invasive mechanical ventilation (IMV), at least for acute exacerbation of chronic obstructive pulmonary disease (AE-COPD). Authors reached their conclusions based on a well-conducted study, with data coming from one of the most known acute care databases (Acute Physiology and Chronic Health Evaluation, APACHE) (8). Since it is a retrospective study, it may represent an interesting picture of NIV diffusion and use in U.S. intensive care, including 38 different-level hospitals and more than 3,500 patients. Of note, it provides the information that during the 4 years of observation 1 of 3 patients with AE-COPD did not require ventilation at all (regardless of technique). Of the 2,500 patients ventilated, the ratio between NIV group versus those in IMV was 1:1.5; it is possible to assume that nowadays NIV is considered, as it is, a valid therapeutic option for AE-COPD by U.S. clinicians, even in the absence of clear recommendation (9, 10). The article is based on a robust statistic approach aimed to eliminate bias, with particular regard to patient's different illness severities. Unfortunately, some of these strength points are also the major study limitations. Given the retrospective approach, the decision of use/do not use NIV was not based on algorithm and/or unique criteria, but on clinician's judgment: not surprisingly, the raw data showed a higher Simplified Acute Physiology Score II in the IMV group. The same consideration is related to the NIV-failure criteria: if the NIV maker is an artist, her/his propensity to prolong or prematurely interrupt this support might differ quite a lot from one to another, influencing the result of NIV-failure group: not irrelevant in this context is the increasing use of NIV as a palliative measure (11), which may influence or even force clinicians' decision and attitude. Another crucial element for assessing the right perspective of this article is the source of the data. APACHE is a robust and valid database, but for the aim of this study, some important information is missing: 1) the diagnosis of chronic obstructive pulmonary disease is based (once again) on clinician's observation, and not on measurable data, leading to a potential misdiagnosis (12). 2) The database does not include any reference to the type of NIV used and if different setting options were used among the patient population; this would not have been included in the propensity scoring: so far, it is uncertain if the

***See also p. 1386.**

Key Words: chronic obstructive pulmonary disease acute exacerbation; noninvasive ventilation; noninvasive ventilation indication; noninvasive ventilation limits; noninvasive ventilation palliative

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correct NIV technique was applied to the correct presentation of AE-COPD and its influence on the overall results. The role of these confounders, finally, might be higher than expected after the variable matching, as argued by Pearl (13).

In conclusion, the present study confirms that NIV invasion is started and probably is a pacific and healthy invasion; nevertheless some questions need to be highlighted: if NIV is an art, how can we identify an artist? Ideally, the "artistic" aspect should be related solely to the complex and multifaceted world of patient-ventilator interaction, interface type, and ventilator setting; NIV indication, which would require a common approach based on evidence, should be less artistic. This aspect is important so as not to charge on the physician's shoulders alone the weight of her/his decision. The article by Stefan et al (7) well documented how much the clinician's judgment is crucial during several steps of AE-COPD overview, diagnosis, and treatment. In this difficult approach, their data, confirming the high mortality of patients failing NIV as a first-line intervention, suggest also that significant physiological derangement at baseline is a per se predictor of NIV failure, providing an important element to facilitate the decision-making process.

At the end of the story, as intensivists, we cannot avoid to ask us how much our perception of NIV failure/success is altered by considering ICU or in-hospital mortality our main outcome? If the NIV invasion may encourage its use beyond its intrinsic limits in more severe patients (palliative, do not resuscitate), maybe more extensive data on mortality are needed to match the short-term clinical impact of our therapy and real effect on patients' life. In the present study, medium- and long-term outcomes are not evaluated, and this concern cannot be definitely clarified.

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The Natural Order of Things: Explanation of Inflammatory Mediators in Prehospital Hypotensive Patients With Blunt Trauma*

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***See also p. 1395.**

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Most trauma centers in the United States treat a preponderance of blunt trauma versus penetrating or burn trauma. The approaches to initial resuscitative efforts vary slightly based on the early recognition of hemorrhagic shock, interpretation of the literature, cost, and style. Subsequently, it is not difficult to understand that exact methods of resuscitation have yet to be elucidated as the science of inflammation, resuscitation, and healing remains yet to be identified and perfected. Equally as challenging is identifying those patients requiring proper resuscitation earlier in their course (1, 2). Prehospital resuscitation in the hypotensive patient with penetrating injury via crystalloid is also controversial at best, but it may best be used in the symptomatic hypotensive patient (3). Many believe that earlier resuscitation with